

ANNUAL OPERATIONS AND MAINTENANCE REPORT, YEAR SEVEN OF THE LONG- TERM PHASE FOR THE SMALL FILLS

**Sharkey Landfill Superfund Site
Morris County, New Jersey**

Prepared for: Sharkey Landfill Agreement Group
Technical Committee

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July 2010

Project No. 943-6198

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1.0 INTRODUCTION

1.1 Report Requirements

This Operations and Maintenance (O&M) Report is submitted as required by the Revised Final (100%) Design Report (Golder Associates, 2000), and presents the results of the Annual Monitoring Event for Year Seven of the Long-Term Phase of the Northwest-North Fill / Northwest-South Fill / Southwest Fill (Small Fills). The Annual Monitoring Event was conducted by Golder Associates Inc. (Golder Associates) in April 2010. Results of water level (hydraulic) monitoring are not included with this report, as they are now currently managed by the Township of Parsippany-Troy Hills.

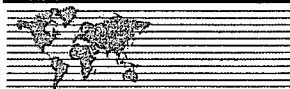
Sections E.10 and E.12 of the Statement of Work (SOW) outline the requirements of the Long-Term Phase of the Small Fills. Specifically, Golder Associates collected samples from the ten (10) groundwater monitoring wells on the Small Fills and each of the six (6) surface water stations in the Whippany River (i.e., W1(U), W2(U), W3(D), W4(U), W5(UD) and W6(D)). Golder Associates attempted to collect two composite samples from the groundwater extraction system (GWES) for the North and South Fills during April 2010. When Golder Associates attempted to collect the composite samples, there was no power to the system.

The groundwater and surface water sampling was conducted from April 5, 2010 through April 7, 2010. The groundwater samples were analyzed for the Target Compound List (TCL) list (Exhibit A of the SOW), including the Well Chemicals (WC) list (Exhibit B of the SOW) and the surface water samples were analyzed for the TCL list, including the River Chemicals (RC) list (Exhibit C of the SOW).

The monitoring program for the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills, was performed in accordance with Appendices B and C, *Performance Monitoring Field Sampling and Quality Assurance Plan for the Remedial Action (PMP)* and *Health and Safety/Contingency Plan for Operation and Maintenance Activities*, respectively, of the Revised O&M Plan (Golder Associates, 2005), and with the SOW, Appendix B of the Consent Decree. This report is submitted, as required, to both the United States Environmental Protection Agency (USEPA) and the New Jersey Department of Environmental Protection (NJDEP).

1.2 Project Background

The Sharkey Landfill Superfund Site (Site) is located in the Townships of Parsippany-Troy Hills and East Hanover, in Morris County, New Jersey. The Site is bounded by Route 46, New Road, and the Rockaway River and extends south beyond Interstate Route 280 between Troy Meadows and the Hatfield Swamp. The landfill Site is approximately 90 acres in size and is divided into five separate landfill areas: the North Fill, South Fill, Northwest-North Fill, Northwest-South Fill, and Southwest Fill.



In September 1983, the Sharkey Landfill Site was included on the National Priorities List as a result of assumed impacts from historic fill material. Various contractors for the NJDEP conducted a remedial investigation and feasibility study (RI/FS) through July 1986. The results of the RI/FS indicated the presence of low concentrations of organic (including pesticides) compounds and inorganic compounds in soils, and low concentrations of organic and inorganic compounds in the shallow water beneath the Site. The shallow water bearing zone beneath the Site that is referenced throughout this report ("shallow groundwater") is isolated both vertically and horizontally. As concluded in the RI, the shallow groundwater is isolated from deeper groundwater systems by a confining varved clay layer which is continuous across the Site and beneath the Fill areas. The shallow groundwater beneath the Fill areas immediately discharges into the adjacent Rockaway and Whippany Rivers, which form hydraulic barriers for the lateral migration of the water beneath the Fill areas; hence the shallow water beneath the Site is isolated vertically and horizontally from regional groundwater systems.

Based on the results of the RI, the USEPA and NJDEP established cleanup goals and objectives for the Site. The USEPA selected a remedy to accomplish these goals, which is presented in the Record of Decision (USEPA, 1986).

The USEPA modified the selected remedy and notified the public in the Explanation of Significant Differences (USEPA, 1993). The Consent Decree, issued by USEPA in 1994, outlines the responsibilities of the Group, the Township of Parsippany-Troy Hills, and others for remedial design, remedial action (RA), and Operations & Maintenance (O&M).

The SOW, included as Appendix B to the Consent Decree, provides explicit details about the shallow groundwater monitoring, surface water monitoring (collectively referred to as "monitoring"), and reporting requirements that are required during the O&M phase of the project. Specifically, the O&M requirements are provided in Sections E.10 through E.15 of the SOW. These sections provide separate criteria for shallow groundwater versus surface water, and North and South Fills versus the Small Fills. These sections also break down the O&M into the different phases of work (First Baseline, 5-Year Pump and Treat, Second Baseline, and Long-Term). The SOW Appendices also list the analytical parameters that must be sampled and tested for during the O&M phase, and the Well and River Trigger Levels that will be used to evaluate the effectiveness of the remedy. In accordance with a letter received from the USEPA dated July 20, 2005, the analytical sampling frequency at the Small Fills was modified to annual.

The First Baseline Phase for the North and South Fills was completed in 2002. For the First Baseline Phase, the groundwater at the Site showed only two exceedances of the Well Trigger Levels prior to start-up of the GWES system. During the sampling events of the First Baseline Phase, several parameters exceeded the River Trigger Levels. These parameters were not believed to be associated with the landfill areas, and none of these exceedances were considered Trigger events. These initial sampling results

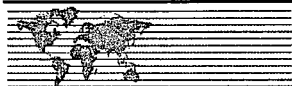


continued to indicate that there does not appear to be elevated levels of the constituents of concern at the Site.

On April 21, 2005, the Group petitioned the USEPA within its rights under the Consent Decree to modify the SOW O&M requirements on the Small Fills. The USEPA responded and agreed to the requested modifications to the O&M requirements on in a letter dated July 20, 2005. As per the modified O&M requirements, the groundwater and surface water monitoring has been conducted on an annual basis. The hydraulic monitoring became the responsibility of the Township of Parsippany-Troy Hills in 2003. In 2008, the Township requested that the groundwater extraction system on the North and South Fills be turned off. The USEPA *has awaiting response from Township per email from Golder dated June 22nd*.

The 5-Year PT Phase for the North and South Fills was completed in 2007. There were no exceedances of the Well Trigger Levels at the Site in the composite samples collected as part of the 5-Year Pump and Treat Phase of the North and South Fills. These sampling results also continued to indicate that there does not appear to be elevated levels of the Site constituents of concern in the North and South Fills. Also, based on the results of the shallow groundwater level monitoring conducted in 2003, 2004, and 2005, the GWES system at the North and South Fills appeared to be effective in achieving hydraulic capture of the shallow groundwater by reducing the overall shallow groundwater elevations at the Site.

The First Baseline Phase for the Small Fills was completed in 2003, and Years One through Six of the Long-Term Phase for the Small Fills were completed in 2004 through 2009, respectively. There were no exceedances of the Well Trigger Levels at the Site in the 2003, 2004, 2006, 2007, 2008, or 2009. In 2005, there was an exceedance of the Well Trigger Level for Mercury in one well on the Southwest Fill. However, it is not believed that the mercury result constitutes a trigger level exceedance because laboratory contamination of the sample was suspected, the historical results for the particular well and all other shallow groundwater monitoring wells in the Small Fills have been non-detect for mercury, and the resampling that was conducted at the well was non-detect for mercury. Bromodichloromethane exceeded the River Trigger Level in various surface water stations on several occasions in 2003, 2004, 2005, and 2006. However, bromodichloromethane is not believed to be associated with the landfill areas, and none of these exceedances are considered Trigger events. In 2007, acrylonitrile was detected at W-1(U), the furthest upstream sampling location, and not at any of the downstream locations; therefore, it was unlikely that the exceedance was associated with the landfill areas, and as such did not constitute a trigger level exceedance. There were no exceedances of the River Trigger Levels in 2008.



2.0 ANNUAL MONITORING EVENT, YEAR SEVEN OF THE LONG-TERM PHASE FOR THE SMALL FILLS

2.1 Water Quality Monitoring Program

2.1.1 Groundwater

All groundwater sample references throughout this report refer to the shallow water bearing zone beneath the Site. During the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills, Golder Associates collected groundwater samples from:

- Three (3) monitoring wells on the Northwest-North Fill (M-17, M-18, and M-26);
- Four (4) monitoring wells on the Northwest-South Fill (M-19A, M-20, M-21, and M-22); and,
- Three (3) monitoring wells on the Southwest Fill (M-23, M-24, and M-25)¹.

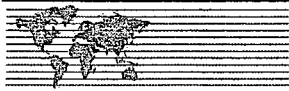
The groundwater samples were analyzed for the TCL list (Table 2 and Exhibit A of the SOW), including the WC list (Table 3 and Exhibit B of the SOW). The sample point identifications, sampling dates and parameters analyzed are summarized in Table A-1 of Appendix A.

All groundwater samples were collected using the USEPA Region II low-flow purging and sampling method (USEPA, 1998), in accordance with the PMP (Appendix B of the O&M Plan). The wells were purged at a rate of approximately 0.3 liters per minute with permanently installed, dedicated, pneumatic (Well WizardTM) bladder pumps. Water levels were monitored using an electronic water level meter and the pumping rate was maintained unless water level drawdown was observed, at which time the rate was reduced to maintain the initial water level as much as reasonably practicable. The wells were purged until the field parameters of temperature, pH, oxidation-reduction potential (ORP), turbidity, conductivity, and dissolved oxygen (DO) stabilized over a minimum of three consecutive readings measured in a flow-through cell at approximate 5-minute intervals. These data were recorded on the Sample Collection Forms. Stabilization was considered complete when at least one discharge tubing volume was purged, and the three consecutive readings agreed within the following criteria:

- ± 0.1 standard units for pH;
- ± 10 mV for ORP; and,
- $\pm 10\%$ for temperature, conductivity, turbidity and DO.

Once the parameters stabilized, the flow-through cell was disconnected and the groundwater sample was collected directly from the TeflonTM-lined tubing dedicated to each Well WizardTM. The pre-preserved sample bottles were then filled and transported to the analytical lab in accordance with the PMP.

¹ Each sample point was assigned a unique identification number pursuant to Section 2.3.3 of the PMP. All subsequent references to samples in this report are made using these designations.



A summary of the stabilized field measurements (i.e., pH, specific conductance, DO, ORP, turbidity and temperature) is presented in Table 1. Appendix B provides a summary of detected compounds for the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills.

In addition to the primary groundwater samples, the following quality control (QC) samples were collected in accordance with the PMP:

- One (1) field duplicate sample;
- One (1) matrix spike/matrix spike duplicate (MS/MSD); and,
- Two (2) trip blanks.

The QC samples were collected in the field and submitted to the analytical laboratory for analysis along with the primary samples.

2.1.2 Surface Water

Golder Associates collected samples from each of the six surface water stations in the Whippany River (i.e., W1(U), W2(U), W3(D), W4(U), W5(U/D) and W6(D)). The samples were analyzed for the TCL list (Table 2 and Exhibit A of the SOW), including the RC list (Table 4 and Exhibit C of the SOW). The sample point identifications, sampling dates and parameters analyzed are summarized in Table A-1 of Appendix A.

Since the Whippany River had a noticeable flow (i.e., it was not impounded), Golder Associates collected the samples by wading into the river, facing upstream, and directly immersing the sample bottle into the water. A low velocity area was chosen because high water velocity can cause the re-suspension of bottom deposits and bias the sample results. Disturbance of bottom sediments can also cause false field parameter readings. Prior to sample collection, the water-quality meter (Horiba-U22®) probe was placed into the water adjacent to each sampling station and the field parameters (temperature, pH, specific conductivity, turbidity, ORP and DO) were measured and recorded on the Sample Collection Form. A summary of the field measurements is presented in Table 1.

The samples were collected so that the preservatives were not displaced from pre-preserved sample containers, such as the 40-ml volatile organic compound (VOC) vials. Immediately after sample collection, sample bottles were placed in a cooler with wet ice and the COC form completed and included with the cooler. The samples were maintained at approximately 4°C and transported to the lab in accordance with the PMP.

In addition to the primary surface water samples, the following quality control (QC) samples were collected in accordance with the PMP:



- One (1) field duplicate sample;
- One (1) MS/MSD; and,
- One (1) trip blank.

The QC samples were collected in the field and submitted to the analytical laboratory for analysis along with the primary samples. Appendix B provides a summary of detected compounds for the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills.

2.2 Analytical Parameters and Methodologies

The complete list of analytical parameters required as part of the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills is presented in Tables 2, 3, and 4. These parameters can be subdivided into the following general groups:

- TCL Chemicals (VOCs, semi-volatile organic compounds (SVOCs), inorganics, and pesticides/polychlorinated biphenyls (PCBs));
- Well Chemicals (VOCs, SVOCs, and inorganics);
- River Chemicals (VOCs); and,
- Field Parameters.

CompuChem of Cary, North Carolina performed all of the analyses in accordance with the PMP. The organic parameters (VOCs, SVOCs, pesticides, and PCBs) were analyzed in accordance with the USEPA Contract Laboratory Program (CLP) *Statement of Work for Organics Analyses Multi-Media, Multi-Concentration Organics Analysis, SOM01.2* with the exception of VOCs for the surface water samples. Inorganics were analyzed using CLP *Statement of Work for Inorganics Analyses Multi-Media, Multi-Concentration, ILM05.4*. Golder Associates analyzed the field parameters during sampling in accordance with the PMP.

The surface water VOCs were analyzed in accordance with the USEPA CLP *Statement of Work Statement of Work for Organics Analyses Multi-Media, Multi-Concentration Organics Analysis Trace Volatile Organic Compounds, SOM01.2* using a 25 mL purge volume to achieve detection limits low enough to meet the volatile compound River Trigger Levels. As part of the River Chemicals list, the surface water samples were also analyzed for three additional volatile compounds: acrolein, acrylonitrile, and 2-chloroethyl vinyl ether in accordance with USEPA SW846 *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Method 8260B*.

2.3 Data Validation

Golder Associates validated 100% of the analytical data collected during the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills pursuant to the PMP. The data was validated for precision, accuracy, representativeness, comparability, and completeness (collectively known as,



“PARCC”) using the criteria specified in the PMP, the Region II data validation guidelines defined below, and the individual analytical methodologies.

Data validation was performed in accordance with the following Region II Standard Operating Procedures (SOPs) and the individual methods listed in Tables B-7 through B-9 of the PMP:

- HW-33, Revision 1 – USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organic Analysis of Low/Medium Concentration of Volatile Organic Compounds SOM01.2, August 2007;
- HW-34, Revision 1 – USEPA CLP SOW for Organic Analysis of Trace Concentration of Volatile Organic Compounds SOM01.2, August 2007;
- HW-35, Revision 1 – USEPA CLP SOW for Organic Analysis of Low/Medium Concentration of Semivolatile Organic Compounds by SOM01.2, August 2007;
- HW-36, Revision 1 – USEPA CLP SOW for Organic Analysis of Low/Medium Concentration of Pesticide Organic Compounds SOM01.2, August 2007;
- HW-37, Revision 1 – USEPA CLP SOW for Organic Analysis of Low/Medium Concentration of Aroclor Organic Compounds SOM01.2, August 2007;
- HW-2, Revision 13 – Validation of Metals for the Contract Laboratory Program (CLP) based on SWO ILM05.3, September 2006; and
- HW-24, Revision 1 – Validating Volatile Organic Compounds by SW-846 Method 8260B, June 1999.

Collectively, these documents are referred to as the functional guidelines. The results of the data validation are discussed in detail in the Data Validation Narrative in Appendix A. In general, the PARCC criteria specified in the PMP were achieved for all methods used to analyze the samples collected as part of the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills. Any deficiencies noted during validation and the qualifiers that were applied to the data are summarized in the tables in Appendix A.

Following data validation, the analytical data and corresponding qualifiers were summarized for each sample point. These qualified results are provided in the Summary of Validated Data Tables, which are located in Appendix B. In accordance with the SOW, the results were compared to the applicable trigger levels specified in Exhibits A, B and C of the SOW (Tables 3 and 4 of this report, respectively), discussed in Section 2.4 of this report.

The data validation results indicate that all of the data are acceptable, with a few exceptions as further discussed in Appendix A. In some cases the data required qualification due to quality control criteria not being achieved. However, in general, the data are deemed usable for the objectives of the O&M monitoring program.



2.4 Water Quality Monitoring Results

A summary of analyte detections for the samples collected at the Site during the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills is included in Appendix B. The summary tables for each sample point, which are grouped by analytical method, sample matrix and site location, contain the following information:

- Detected Constituents – List of constituents that were detected in any monitoring point, along with the reported concentration;
- Qualifiers – The qualifiers that were applied to the results either by the laboratory or by Golder Associates following data validation;
- Units – The units that are associated with each analytical result; and,
- Trigger Level – The analytical results are compared to the Trigger levels, which are located in Exhibits A, B and C of the SOW. Exceedances of the Trigger levels are shown by boldface type and underlining.

The table header contains the following information: sample identification number, laboratory identification number and date of sample collection.

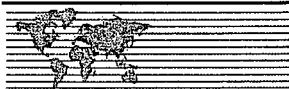
2.4.1 Exceedances of Well Trigger Levels²

The three specific Trigger events, i.e., the Type A Trigger, the Type B Trigger, and the Type C Trigger, are designed to identify when contaminants are migrating out of one or more Fill areas at levels which would necessitate activation of the groundwater extraction system at one or more Fill areas (or portions thereof as approved in writing by USEPA). The Type A and Type C Triggers are described in this section. The Type B Trigger is explained in Section 2.4.2 below.

A "Type A Trigger" would occur, for the purposes of the SOW, when any analysis of any sample taken from any groundwater monitoring well at the Site indicates that the concentration of any Well Chemical is greater than or equal to two times the Well Trigger Level set for that Well Chemical. Groundwater extraction shall be initiated at all groundwater extraction wells associated with the groundwater extraction zones responsible for the exceedance within a USEPA-approved timeframe. Another sample may be obtained, which can be analyzed and the results reported to USEPA, within the aforementioned USEPA-approved timeframe, for consideration in determining the need for initiation of such groundwater extraction.

A "Type C Trigger" would occur, for the purposes of the SOW, whenever the concentration of any Well Chemical in groundwater, averaged over the groundwater monitoring well in any groundwater extraction zone, is equal to or greater than its respective Well Trigger Level.

² The portions of Sections 2.4.1 and 2.4.2 that explain the Trigger types were taken verbatim from Appendix B of the SOW.



There were no Type A or Type C Trigger Level exceedances during the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills, as presented on Figure 1 and in tabular format in Appendix B.

2.4.2 Exceedances of River Trigger Levels

A "Type B Trigger" would occur, for the purposes of the SOW, whenever a) the concentration of a River Chemical at any station located within one-quarter (1/4) mile downstream from any Fill area, or portion thereof ("the downstream location"), in either the Whippany River or the Rockaway River exceeds the River Trigger Level for that Chemical, and either of the following exists: b.1) the concentration of the River Chemical at an upstream location is less than the River Trigger Level; or, b.2) the concentration of a River Chemical at both the upstream and downstream locations are above the River Trigger Level but the downstream concentration is statistically greater than the upstream concentration. The statistical analysis to be used to determine if "the downstream concentration is statistically greater than the upstream concentration" stated in b.2) above shall be a methodology selected by USEPA (or a methodology proposed by the Settling Defendants and consistent with 40 CFR 264.90 through 264.99, approved by EPA).

There were no Type B Trigger Level exceedances during the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills, as presented on Figure 1 and in tabular format in Appendix B.



3.0 CONCLUSIONS

Sampling, analysis and validation of shallow groundwater and surface water samples from the Sharkey Landfill Site as part of the Annual Monitoring Event for Year Seven of the Long-Term Phase for the Small Fills were performed in accordance with the Revised O&M Plan and the SOW, Appendix B of the Consent Decree. The primary purpose of the monitoring is to provide the data necessary to assess the future effectiveness of the required Remedial Action O&M phase at the Site. Sampling results from the Annual Monitoring Event for Year Seven of the Long-Term Phase for the Small Fills indicate that there do not appear to be elevated levels of the Site constituents of concern that would require installation of the groundwater extraction system at the Small Fills.

3.1 Data Quality and Acceptability

The data validation performed on the sample results from the Annual Monitoring Event for Year Seven of the Long-Term Phase for the Small Fills indicates that all of the data, with the exception of few parameters, are acceptable. However, some sample results required qualification due to non-conformance to the requirements of the method or the functional guidelines, as noted in Appendix A.

All sample results that required qualification was performed in accordance with the functional guidelines and are summarized in Tables A-1 and A-2.

3.2 Water Quality

There were no exceedances of the Well Trigger Levels or River Trigger Levels at the Site in the Annual Monitoring Event for Year Seven of the Long-Term Phase for the Small Fills. In summary, these sampling results indicate that there do not appear to be elevated levels of the Site constituents of concern in the Small Fills.

3.3 Future Monitoring Schedule

In December 2008, the Township of Parsippany-Troy Hills petitioned the USEPA to turn off the groundwater extraction system at the North Fill and South Fill. Pending USEPA review, the system may be turned off, in which case Second Baseline Sampling of the North and South Fills, Whippany River and Rockaway River will be conducted. If the system is not turned off, the next analytical sampling event for the Small Fills and the North and South Fills is scheduled to occur in Spring 2011. The hydraulic monitoring, which is now the responsibility of the Township of Parsippany-Troy Hills, will continue to be monitored twice per quarter.



4.0 REFERENCES

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USEPA, October 1993. "Explanation of Significant Differences for the Sharkey Landfill."

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**SUMMARY OF FIELD PARAMETER STABILIZATION DATA
ANNUAL MONITORING EVENT, YEAR SEVEN OF THE LONG TERM PHASE FOR THE SMALL FILLS
SHARKEY LANDFILL
MORRIS COUNTY, NEW JERSEY**

| Field Parameters | | | | | | | | | |
|---------------------|--------------|-------------------|----------|------------------------------|-----------------|-------------------------|----------------------|--------------------------|----------------------------------|
| Well ID | Date Sampled | Temperature [° C] | pH [std] | Specific Conductance [mS/cm] | Turbidity [ntu] | Dissolved Oxygen [mg/l] | Redox Potential [mV] | Depth to Water [ft-btoc] | Notes |
| M-17 | 4/5/10 | 9.1 | 6.60 | 1.010 | 16.0 | 0.00 | -175 | 2.54 | FD Collected MS/MSD Collected |
| M-18 | 4/5/10 | 12.3 | 7.05 | 0.947 | 251.0 | 0.00 | -131 | 5.11 | |
| M-19A | 4/5/10 | 14.5 | 7.03 | 1.280 | 4.3 | 0.06 | -152 | 8.35 | |
| M-20 | 4/5/10 | 16.1 | 6.52 | 2.000 | 0.0 | 0.00 | -95 | 10.41 | |
| M-21 | 4/5/10 | 14.5 | 6.96 | 1.280 | 0.0 | 0.00 | -153 | 13.38 | |
| M-22 | 4/5/10 | 11.4 | 6.89 | 1.600 | 6.3 | 0.00 | -152 | 10.02 | |
| M-23 | 4/6/10 | 10.6 | 6.35 | 1.220 | 42.7 | 0.00 | -98 | 7.77 | |
| M-24 | 4/6/10 | 10.6 | 6.69 | 0.677 | 140.0 | 0.00 | -22 | 4.19 | |
| M-25 | 4/6/10 | 12.0 | 6.59 | 0.847 | 107.0 | 0.00 | -119 | 6.45 | |
| M-26 | 4/5/10 | 9.6 | 5.79 | 0.472 | 8.8 | 0.00 | +96 | 3.25 | |
| Surface Water Point | Date Sampled | Temperature [° C] | pH [std] | Specific Conductance [mS/cm] | Turbidity [ntu] | Dissolved Oxygen [mg/l] | Redox Potential [mV] | Sample Depth | Notes |
| W1(U) | 4/7/10 | 20.8 | 6.83 | 0.469 | 0.0 | 3.65 | +100 | 0.0-3.0 in | MS/MSD Collected |
| W2(U) | 4/7/10 | 18.1 | 6.94 | 0.563 | 0.0 | 4.94 | +100 | 0.0-3.0 in | |
| W3(D) | 4/7/10 | 18.4 | 6.97 | 0.575 | 31.4 | 5.03 | +100 | 0.0-3.0 in | FD Collected |
| W4(U) | 4/7/10 | 17.6 | 6.85 | 0.570 | 0.6 | 3.62 | +77 | 0.0-3.0 in | |
| W5(U/D) | 4/7/10 | 18.3 | 6.88 | 0.593 | 0.0 | 3.61 | +77 | 0.0-3.0 in | |
| W6(D) | 4/7/10 | 18.4 | 7.49 | 1.440 | 6.8 | 3.86 | +11 | 0.0-3.0 in | |

Table by: ELD
Table QC'd by: SLS

Date: 4/12/2010
Date: 4/14/2010

Notes

1. The depth to water was taken prior to purging the well.
2. Stream gauge present but unreadable and bent at W-5(U/D), which is the only stream gauge present.

TABLE 2
SOW TARGET COMPOUND LIST / TARGET ANALYTE LIST
SHARKEY LANDFILL
MORRIS COUNTY, NEW JERSEY

| | | |
|-----------------------------------|------------------------------|-----------------------------|
| <u>Volatiles</u> | | |
| Chloromethane, | 2-Butanone, | 4-Methyl-2-pentanone, |
| Bromomethane, | 1,1,1-Trichloroethane, | 2-Hexanone, |
| Vinyl chloride, | Carbon tetrachloride, | Tetrachloroethene, |
| Chloroethane, | Bromodichloromethane, | Toluene, |
| Methylene chloride, | 1,2-Dichloropropane, | 1,1,2,2-Tetrachloroethane, |
| Acetone, | cis-1,3-Dichloropropene, | Chlorobenzene, |
| Carbon disulfide, | Trichloroethene, | Ethylbenzene, |
| 1,1-Dichloroethene, | Dibromochloromethane, | Styrene, |
| 1,1-Dichloroethane, | 1,1,2-Trichloroethane, | Xylenes (total) |
| 1,2-Dichloroethene (total) | Benzene, | 1,3-Dichlorobenzene, |
| Chloroform, | trans-1,3-Dichloropropene, | 1,4-Dichlorobenzene, |
| 1,2-Dichloroethane, | Bromoform, | 1,2-Dichlorobenzene, |
| | | 1,2,4-Trichlorobenzene |
| <u>Semi-volatiles</u> | | |
| Phenol, | 2,4,6-Trichlorophenol, | Hexachlorobenzene, |
| bis(2-Chloroethyl)ether, | 2,4,5-Trichlorophenol, | Pentachlorophenol, |
| 2-Chlorophenol, | 2-Chloronaphthalene, | Phenanthrene, |
| 2-Methylphenol, | 2-Nitroaniline, | Anthracene, |
| 2,2'-oxybis(1-Chloropropane), | Dimethylphthalate, | Carbazole, |
| 4-Methylphenol, | Acenaphthylene, | Di-n-butylphthalate, |
| N-Nitroso-di-n-propylamine, | 2,6-Dinitrotoluene, | Fluoranthene, |
| Hexachloroethane, | 3-Nitroaniline, | Pyrene, |
| Nitrobenzene, | Acenaphthene, | Butylbenzylphthalate, |
| Isophorone, | 2,4-Dinitrophenol, | 3,3'-Dichlorobenzidine, |
| 2-Nitrophenol, | 4-Nitrophenol, | Benzo(a)anthracene, |
| 2,4-Dimethylphenol, | Dibenzofuran, | Chrysene, |
| bis(2-Chloroethoxy)methane, | 2,4-Dinitrotoluene, | bis(2-Ethylhexyl)phthalate, |
| 2,4-Dichlorophenol, | Diethylphthalate, | Di-n-octylphthalate, |
| Naphthalene, | 4-Chlorophenyl-phenyl ether, | Benzo(b)fluoranthene, |
| 4-Chloroaniline, | Fluorene, | Benzo(k)fluoranthene, |
| Hexachlorobutadiene, | 4-Nitroaniline, | Benzo(a)pyrene, |
| 4-Chloro-3-methylphenol, | 4,6-Dinitro-2-methylphenol, | Indeno(1,2,3-cd)pyrene, |
| 2-Methylnaphthalene, | N-Nitrosodiphenylamine, | Dibenz(a,h)anthracene, |
| Hexachlorocyclopentadiene, | 4-Bromophenyl-phenyl ether, | Benzo(g,h,i)perylene |
| <u>Pesticides/Aroclors</u> | | |
| alpha-BHC, | Endrin, | gamma-Chlordane, |
| beta-BHC, | Endosulfan sulfate, | Toxaphene, |
| delta-BHC, | 4,4'-DDD, | Aroclor-1016, |
| delta-BHC (Lindane), | Endosulfan II, | Aroclor-1221, |
| Heptachlor, | 4,4'-DDT, | Aroclor-1232, |
| Aldrin, | Methoxychlor, | Aroclor-1242, |
| Heptachlor epoxide, | Endrin ketone, | Aroclor-1248, |
| Endosulfan I, | Endrin aldehyde, | Aroclor-1254, |
| Dieldrin, | alpha-Chlordane, | Aroclor-1260 |
| 4,4'-DDE, | | |

TABLE 2
SOW TARGET COMPOUND LIST / TARGET ANALYTE LIST
SHARKEY LANDFILL
MORRIS COUNTY, NEW JERSEY

| Analytes | | |
|-----------------|------------|------------|
| Aluminum, | Cobalt, | Potassium, |
| Antimony, | Copper, | Selenium, |
| Arsenic, | Iron, | Silver, |
| Barium, | Lead, | Sodium, |
| Beryllium, | Magnesium, | Thallium, |
| Cadmium, | Manganese, | Vanadium, |
| Calcium, | Mercury, | Zinc, |
| Chromium, | Nickel, | Cyanide |

Source: Taken from the Sharkey Landfill SOW, Exhibit A

TABLE 3
SOW WELL CHEMICALS AND WELL TRIGGER LEVELS
SHARKEY LANDFILL
MORRIS COUNTY, NEW JERSEY

| Well Chemical | Well Trigger Level (ppb) |
|----------------------------|--|
| Total VOCs | 1000 |
| Benzene: Rockaway River | 50 |
| Whippany River | 100 |
| bis(2-Ethylhexyl)phthalate | 100-299 ^(a) 300 ^(a) |
| N-Nitrosodiphenylamine | 10 |
| Arsenic | 50 |
| Cadmium | 10 |
| Chromium | 50 |
| Lead | 50 |
| Mercury | 2 |
| Silver | 50 |
| Selenium | 10 |
| Barium | 1000 |

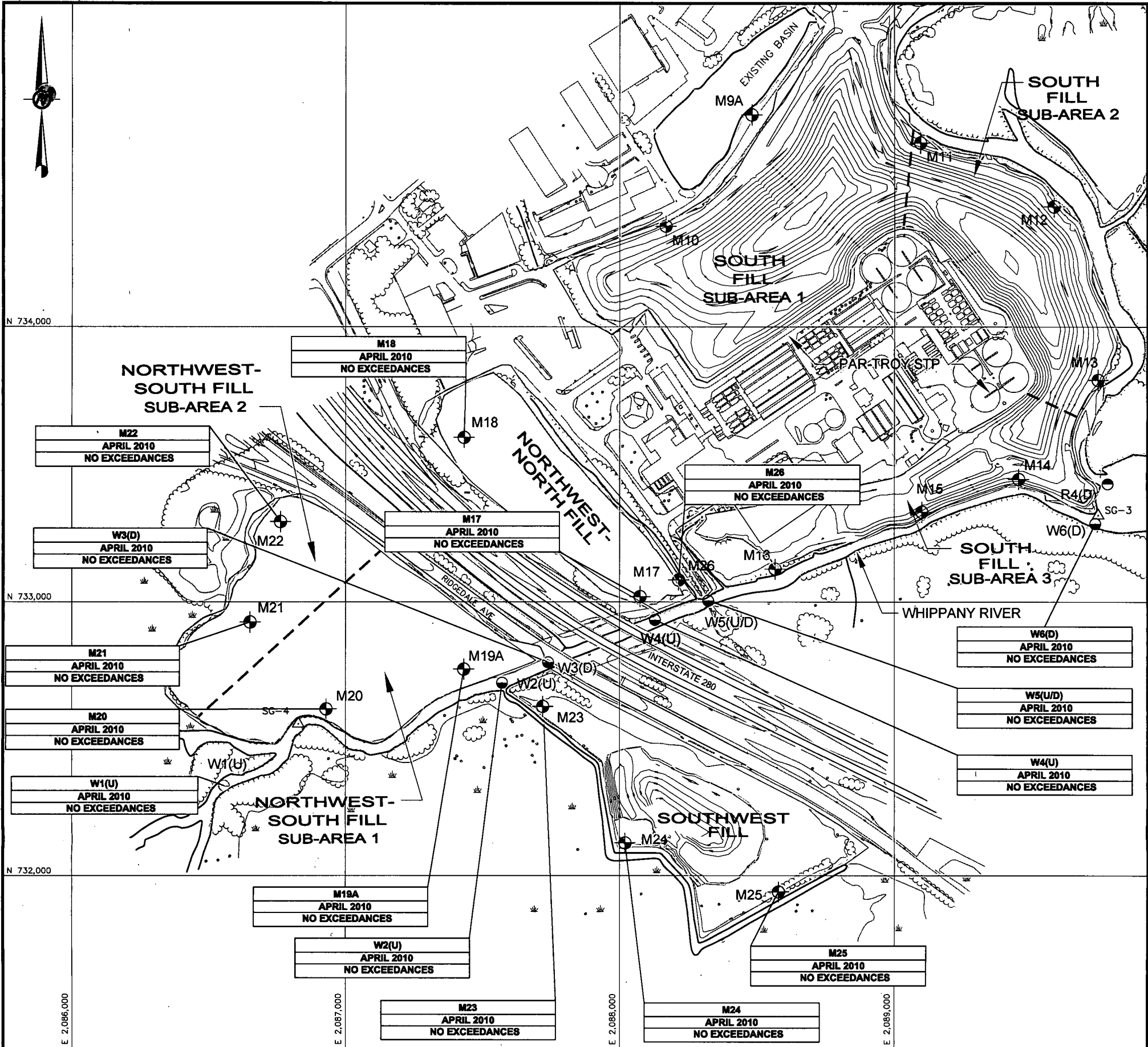
^(a) If concentrations of bis(2-Ethylhexyl)phthalate between 100 and 299 are detected in any GWM well, an evaluation program to determine the impact of bis(2-Ethylhexyl)phthalate on the associated rivers will be initiated. Any concentrations greater than or equal to 300 ppb shall cause the initiation of the GWE program as outlined in the Section E.13 of the SOW.

Source: Taken from the Sharkey Landfill SOW, Exhibit B.

TABLE 4
SOW RIVER CHEMICALS AND RIVER TRIGGER LEVELS
SHARKEY LANDFILL
MORRIS COUNTY, NEW JERSEY

| River Chemicals | River Trigger (ppb) | PQL* (ppb) |
|----------------------------|---------------------|------------|
| Acrolein | 320 | 50 |
| Acrylonitrile | 0.059 | 8 |
| Benzene | 1.2 | 1 |
| Bromoform | 4.3 | 1 |
| Chlorobenzene | 680 | 1 |
| Chlorodibromomethane | 0.41 | 1 |
| 2-Chloroethylvinyl ether | - | 5 |
| Chloroform | 5.7 | 1 |
| Carbon tetrachloride | 0.25 | 1 |
| Dichlorobromomethane | 0.27 | 1 |
| 1,2-Dichlorobenzene | 2700 | 1 |
| 1,3-Dichlorobenzene | 400 | 1 |
| 1,4-Dichlorobenzene | 400 | 1 |
| 1,2-Dichloroethane | 0.38 | 1 |
| 1,1-Dichloroethane | - | 1 |
| 1,1-Dichloroethylene | 0.57 | 1 |
| 1,2-Dichloropropane | 0.52 | 1 |
| 1,3-Dichloropropylene | 10 | 5 |
| Ethylbenzene | 3100 | 1 |
| Methyl bromide | 48 | 1 |
| Methyl chloride | 5.7 | 1 |
| Methylene chloride | 4.7 | 2 |
| 1,2-trans-Dichloroethylene | 700 | 1 |
| 1,1,2,2-Tetrachloroethane | 1.7 | 1 |
| Tetrachloroethylene (PCE) | 0.8 | 1 |
| Toluene | 6800 | 1 |
| 1,1,1-Trichloroethane | 3100 | 1 |
| 1,1,2-Trichloroethane | 6 | 1 |
| Trichloroethylene (TCE) | 2.7 | 1 |
| Vinyl chloride | 2 | 1 |

Source: Taken from the SOW, Exhibit C



LEGEND

- SG-4 APPROXIMATE STAFF GAUGE LOCATION AND DESIGNATION
- SW-1 APPROXIMATE EXTRACTION WELL LOCATION AND DESIGNATION
- P36 APPROXIMATE PIEZOMETER LOCATION AND DESIGNATION
- M14 APPROXIMATE GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- R1(U) APPROXIMATE SURFACE WATER SAMPLING STATION LOCATION AND DESIGNATION IN THE ROCKAWAY RIVER
- W1(U) APPROXIMATE SURFACE WATER SAMPLING STATION LOCATION AND DESIGNATION IN THE WHIPPANY RIVER
- LANDFILL SUB-AREA BOUNDARY
- LIMITS OF REMEDIAL ACTION CONSTRUCTION AS-BUILT SURVEY

NOTES

- 1.) TOPOGRAPHIC DATA PROVIDED WITHIN THE LIMITS OF REMEDIAL ACTION CONSTRUCTION AS-BUILT SURVEY REPRESENT THE AS-BUILT FINAL GRADES AS PROVIDED BY THE REMEDIAL ACTION CONTRACTOR (SEVENSON ENVIRONMENTAL).
- 2.) GROUND SURFACE ELEVATION CONTOURS SHOWN AT 5 FOOT INTERVALS FOR THE NORTH AND SOUTH FILLS AND AT A 1 FOOT INTERVAL FOR THE SMALL FILLS.
- 3.) GROUNDWATER CONTOUR INTERVAL IS ONE FOOT FOR THE SOUTH FILL AND TWO FEET FOR THE NORTH FILL.
- 4.) (U) - UPSTREAM SAMPLING STATION (WITH REGARD TO NEAREST FILL AREA)
(D) - DOWNSTREAM SAMPLING STATION (WITH REGARD TO NEAREST FILL AREA)
- 5.) ALL UNITS ARE ug/L
- 6.) TRIGGER IS EITHER THE WELL TRIGGER LEVEL FROM SOW EXHIBIT B OR RIVER TRIGGER LEVEL FROM SOW EXHIBIT C.

REFERENCES

- 1.) TOPOGRAPHIC DATA WITHIN THE FIVE FILLS WAS PROVIDED BY MOUNTAIN VIEW LAYOUT, DENVILLE, NEW JERSEY, WITH THE EXCEPTION OF TOPOGRAPHY FOR THE SOUTHWEST FILL, WHICH WAS PROVIDED BY GEOD CORP., NEWFOUNDLAND, NEW JERSEY. SEE NOTE 1. FOR ADDITIONAL INFORMATION REGARDING TOPOGRAPHIC DATA WITHIN THE FIVE FILLS. TOPOGRAPHIC DATA OUTSIDE OF THE FIVE FILLS WAS PROVIDED BY ATLANTIC AERIAL COMPANY, INC., BUDD LAKE, NEW JERSEY, DATED OCTOBER 4, 1994, BASED ON AERIAL PHOTOGRAPHY DATED APRIL 1, 1994.



FIGURE 1

GROUNDWATER AND
SURFACE WATER
EXCEEDANCES OF SOW
TRIGGER LEVELS
APRIL 2010

ANNUAL MONITORING EVENT
YEAR SEVEN OF THE
LONG TERM PHASE - SMALL FILLS
SHARKEY LANDFILL SUPERFUND SITE
MORRIS COUNTY, NEW JERSEY



APPENDIX A

**DATA VALIDATION NARRATIVE, ANNUAL MONITORING EVENT
YEAR SEVEN OF THE LONG-TERM PHASE – SMALL FILLS**

**DATA VALIDATION NARRATIVE
ANNUAL MONITORING EVENT
YEAR SEVEN OF THE LONG-TERM PHASE FOR THE SMALL FILLS**

This report presents the findings of the data validation performed on the analyses of shallow groundwater and surface water samples collected for the Annual Monitoring Event, Year Seven of the Long-Term Phase for the Small Fills. The monitoring event was conducted at the Sharkey Landfill Superfund Site (Site) in accordance with the Performance Monitoring Plan for Remedial Action (PMP, December 2005). Samples for the event were collected April 5, 2010 through April 7, 2010 (Table A-1). The chemical data for samples collected at the Site were validated to identify quality issues which could affect the use of the data for decision making purposes.

A total of ten (10) groundwater and six (6) surface water samples, as well as two (2) field duplicates, two (2) matrix spike/matrix spike duplicates (MS/MSDs), and three (3) trip blanks for Quality Control (QC) purposes, were collected for chemical analysis during the sampling events. The groundwater samples were analyzed for the Target Compound List (TCL) chemicals which include the Well Chemicals (WC) List, as identified in Tables 2 and 3, respectively, of the Annual Operations and Maintenance Report, Year Seven of the Long-Term Phase for the Small Fills. The surface water samples were analyzed for the TCL chemicals and the River Chemicals (RC) List, as identified in Tables 2 and 4, respectively, of the Annual Operations and Maintenance Report, Year Seven of the Long-Term Phase for the Small Fills. Field duplicates were analyzed for the same parameters as their parent sample and the trip blank samples were analyzed for VOCs only. CompuChem of Cary, North Carolina performed all chemical analyses following USEPA method guidelines:

- VOCs, SVOCs, and Pesticides/PCBs following USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Organics Analysis SOM01.2, October 2006;
- RC List VOCs following USEPA CLP SOW for Low Concentration Organic Analysis SOM01.2 Trace, October 2006;
- RC list VOCs (acrolein, acrylonitrile, and 2-chloroethyl vinyl ether only) following USEPA SW846 Method 8260B Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) (December, 1996); and,
- Metals following USEPA CLP SOW for Multi-Media, Multi-Concentration Inorganics Analysis ILM05.4, December 2006.

Information regarding the sample point identifications, analytical parameters, QC samples, sampling dates, and contract laboratory sample delivery group (SDG) designations are summarized in Table A-1.

The laboratory data were validated in accordance with the PMP for precision, accuracy, representativeness, comparability, and completeness (PARCCs) to verify data usability. Validation was performed on 100% of the data submitted by the Laboratory. Data validation was performed in accordance with the following documents:

- USEPA Region II Standard Operating Procedure (SOP) No. HW-33, Revision 1 – USEPA Contract Laboratory Program Statement of Work for Organic Analysis of Low/Medium Concentration of Volatile Organic Compounds SOM01.2 Data Validation, August 2007;
- USEPA Region II SOP No. HW-34, Revision 1 USEPA Contract Laboratory Program Statement of Work for Organic Analysis of Trace Concentration of Volatile Organic Compounds SOM01.2 Data Validation, August 2007;
- USEPA Region II SOP No. HW-24, Revision 1, Validating Volatile Organic Compounds by SW-846 Method 8260B, June 1999;
- USEPA Region II SOP No. HW-35, Revision 1, USEPA Contract Laboratory Program Statement of Work for Organic Analysis of Low/Medium Concentration Semivolatile Organic Compounds SOOM01.2, August 2007;
- USEPA Region II SOP No. HW-36, Revision 1, USEPA Contract Laboratory Program Statement of Work for Organic Analysis of Low/Medium Concentration of Pesticide Organic Compounds SOM01.2, August 2007;
- USEPA Region II SOP No. HW-37, Revision 1, USEPA Contract Laboratory Program Statement of Work for Organic Analysis of Low/Medium Concentration of Aroclor Organic Compounds SOM01.2, August 2007; and,
- USEPA Region II SOP No. HW-2, Revision 13 – Validation of Metals for the Contract Laboratory Program, September 2006.

Chemical results for the samples collected at the Site were qualified on the basis of outlying precision or accuracy parameters, or on the basis of professional judgment. The following definitions provide brief explanations of the qualifiers which may have been assigned to data during the data validation process.

- | | |
|----|---|
| J | The analyte was reported above the method detection limit; however, the associated numerical value is the approximate concentration of the analyte in the sample. |
| JN | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration. |
| U | The analyte was analyzed for, but was not detected above the method detection limit. |
| UJ | The analyte was not detected above the method detection limit. The associated quality control measurements indicate the quantitation limit is approximate. |
| R | The sample result was rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. |

In general, the data generated during the monitoring event met the QC criteria established in the respective USEPA methods and Region II Data Validation Standard Operating Procedures (SOPs). The following bulleted items highlight qualifications to specific parameters. Although these qualifications were applied to some of the samples collected at the Site, the qualifications may not have been required or applied to all samples collected. Table A-2 summarizes all qualifications applied to the data, with applicable qualifier codes.

- Surface water quantitation limits for phenol, bis (2-chloroethyl) ether, N-Nitroso-di-n-propylamine, and 4-methylphenol were qualified estimated (UJ) for non-detected results due to continuing calibration verification percent difference greater than $\pm 25\%$.
- Surface water results for 2-chloroethyl vinyl ether were rejected (R) due to continuing calibration percent drift exceeding 90%.
- Surface water results for aluminum, barium, and beryllium were qualified as non-detect (U) and reported at the contract required quantitation limit (CRQL) due to continuing calibration blank contamination.
- Surface water quantitation limits for benzaldehyde, 2,4-dichlorophenol, hexachlorobutadiene, 4-chloro-3-methylphenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 1,2,4,5-tetrachlorobenzene, and pentachlorophenol were qualified as estimated (UJ) due to deuterated monitoring compound recoveries below quality control (QC) limits.
- Surface water quantitation limits for acrolein and acrylonitrile were qualified estimated (UJ) for non-detected results as the initial calibration relative response factor was less than 0.050.
- Surface water quantitation limits for 2-chloroethyl vinyl ether were qualified estimated (UJ) when non-detect due to laboratory control sample recoveries above QC limits.
- Surface water results for vanadium and zinc were qualified as non-detect (U) and reported at the CRQL due to preparation blank contamination.
- Surface water results for potassium were qualified as estimated (J) as the serial dilution percent difference was greater than 10% but less than 100%.
- Surface water results for carbon disulfide were qualified as non-detect (U) and reported at the CRQL due to trip blank contamination.
- Groundwater results for beta-BHC and gamma-chlordane were qualified as non-detect (U) and reported at the CRQL as the percent difference between the two analytical columns was greater than 50% and the sample results were less than the CRQL.
- Groundwater results for beta-BHC were qualified as estimated/tentatively identified (JN) as the percent difference between the two analytical columns was greater than 51% and less than 100%.
- Groundwater quantitation limits for bromomethane were qualified estimated (UJ) for non-detected results due to continuing calibration verification percent difference greater than $\pm 25\%$.
- Groundwater results for aluminum, arsenic, cadmium, cobalt, nickel, thallium, and vanadium were qualified as non-detect (U) and reported at the CRQL due to continuing calibration blank contamination.
- Groundwater quantitation limits for benzaldehyde, phenol, naphthalene, 2-methylnaphthalene, 2-chloronaphthalene, acenaphthylene, acenaphthene, hexachlorobenzene, atrazine, phenanthrene, anthracene, benzo(b)fluoranthene,

benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, pesticides, and PCBs were qualified as estimated (UJ) due to deuterated monitoring compound recoveries below quality control (QC) limits.

- Groundwater results for 1,4-dioxane were rejected (R) for non-detected results as the initial calibration relative response factor was less than 0.010.
- Groundwater results for beryllium were qualified as non-detect (U) and reported at the CRQL due to preparation blank contamination.
- Groundwater results for potassium were qualified as estimated (J) as the serial dilution percent difference was greater than 10% but less than 100%.
- Groundwater results for acetone were qualified as non-detect (U) and reported at the CRQL due to trip blank contamination.

Based on the data validation, the analytical data for samples collected at the Site were determined to be acceptable (including estimated data) for their intended use, with the exception of data qualified as R (rejected). Acceptable levels of accuracy and precision were achieved for the majority of the surface and groundwater data, as indicated by the data completeness of 99.5% (i.e., the ratio of the amount of valid data obtained to the amount expected, including estimated (J/UJ) data), which meets the completeness goal specified in the PMP for the Site.

**TABLE A-1
SAMPLE POINT IDENTIFICATIONS
YEAR SEVEN OF THE LONG-TERM PHASE - SMALL FILLS
SHARKEY LANDFILL**

| Lab SDG | Field ID | Matrix | Sample Date | WC VOCs ¹ | RC VOCs ² | SVOCs ¹ | Pesticides /PCBs ¹ | Metals ³ | MS/MSD | Duplicate |
|---------------------|-------------|--------|-------------|----------------------|----------------------|--------------------|----------------------------------|---------------------|--------|-----------|
| 1004032 | M-17 | GW | 4/5/2010 | X | | X | X | X | | |
| 1004032 | M-18 | GW | 4/5/2010 | X | | X | X | X | | |
| 1004032 | M-26 | GW | 4/5/2010 | X | | X | X | X | | |
| 1004032 | M-19A | GW | 4/5/2010 | X | | X | X | X | | |
| 1004032 | M-20 | GW | 4/5/2010 | X | | X | X | X | X | |
| 1004032 | M-21 | GW | 4/5/2010 | X | | X | X | X | | |
| 1004032 | M-19A FD | GW | 4/5/2010 | X | | X | X | X | | X |
| 1004032 | M-22 | GW | 4/5/2010 | X | | X | X | X | | |
| 1004032 | M-23 | GW | 4/6/2010 | X | | X | X | X | | |
| 1004032 | M-24 | GW | 4/6/2010 | X | | X | X | X | | |
| 1004032 | M-25 | GW | 4/6/2010 | X | | X | X | X | | |
| 1004066/1004058 | W1 U | SW | 4/7/2010 | | X | X | X | X | | |
| 1004066/1004058 | W2 U | SW | 4/7/2010 | | X | X | X | X | | |
| 1004066/1004058 | W3 D | SW | 4/7/2010 | | X | X | X | X | | |
| 1004066/1004058 | W4 U | SW | 4/7/2010 | | X | X | X | X | X | |
| 1004066/1004058 | W5 U-D | SW | 4/7/2010 | | X | X | X | X | | |
| 1004066/1004058 | W6 D | SW | 4/7/2010 | | X | X | X | X | | |
| 1004066/1004058 | W4 (U) (FD) | SW | 4/7/2010 | | X | X | X | X | | X |
| Field Blanks | | | | | | | | | | |
| 1004032 | TBGW-040510 | TB | 4/5/2010 | X | | | | | | |
| 1004032 | TBGW-040610 | TB | 4/6/2010 | X | | | | | | |
| 1004066/1004058 | TBSW-040710 | TB | 4/7/2010 | | X | | | | | |

Notes:

All samples to be analyzed for chemical analysis were shipped to CompuChem of Cary, North Carolina.

¹VOCs, SVOCs, and Pesticides/PCBs following USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Organics Analysis SOM01.2, October 2006.

²RC list VOCs following USEPA CLP SOW for Low Concentration Organic Analysis SOM01.2 (trace) and USEPA SW846 Method 8260B Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) (December 1996) for acrolein, acrylonitrile, and 2-chloroethyl vinyl ether only.

³Metals including cyanide by USEPA CLP SOW for Multi-Media, Multi-Concentration Inorganics Analysis ILM05.4, December 2006.

Abbreviations:

SDG = Sample Delivery Group
MS/MSD = Matrix Spike/ Matrix Spike Duplicate
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
TB = Trip Blank
WC = Well Chemicals
RC = River Chemicals

TABLE A-2
SUMMARY OF DATA QUALIFICATIONS
YEAR SEVEN OF THE LONG-TERM PHASE - SMALL FILLS
SHARKEY LANDFILL

| SDG | Field ID | Matrix | Analysis | Analyte | New Result | New RL | QUAL | Golder Qual Code | Comments |
|---------|------------|--------|----------|---------------------|------------|--------|------|------------------|---|
| 1004032 | M-17 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-17 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-17 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-17 | GW | PCBs | All PCBs | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-17 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-18 | GW | Metals | Arsenic | 10 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-18 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-18 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-18 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-18 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-19A | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-19A | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-19A | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-19A | GW | PCBs | All PCBs | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-19A | GW | Pests | gamma-Chlordane | 0.05 | - | U | PD | %D between columns > 50% and sample results < CRQL. |
| 1004032 | M-19A | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-19A | GW | Pests | Beta-BHC | - | - | JN | PD | %D between columns > 51 and <100%. |
| 1004032 | M-19A (FD) | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-19A (FD) | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-19A (FD) | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-19A (FD) | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-19A FD | GW | Pests | Beta-BHC | 0.05 | - | U | PD | %D between columns > 50% and sample results < CRQL. |
| 1004032 | M-20 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-20 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-20 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-20 | GW | Metals | Cobalt | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-20 | GW | Metals | Thallium | 25 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-20 | GW | Metals | Arsenic | 10 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-20 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-20 | GW | PCBs | All PCBs | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | 2-chloronaphthalene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | 2-methylnaphthalene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | acenaphthene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | acenaphthylene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | anthracene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | atrazine | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | Benzaldehyde | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | benzo(a)pyrene | - | - | UJ | DMCL | DMC recovery below QC Limits. |

**TABLE A-2
SUMMARY OF DATA QUALIFICATIONS
YEAR SEVEN OF THE LONG-TERM PHASE - SMALL FILLS
SHARKEY LANDFILL**

| SDG | Field ID | Matrix | Analysis | Analyte | New Result | New RL | QUAL | Goldier Qual Code | Comments |
|---------|----------|--------|----------|------------------------|------------|--------|------|-------------------|---|
| 1004032 | M-20 | GW | SVOCs | benzo(b)fluoranthene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | benzo(g,h,i)perylene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | benzo(k)fluoranthene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | dibenzo(a,h)anthracene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | hexachlorobenzene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | indeno(1,2,3-cd)pyrene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | naphthalene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | phenanthrene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | SVOCs | phenol | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-20 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-20 | GW | Pests | Beta-BHC | - | - | JN | PD | %D between columns > 51 and <100%. |
| 1004032 | M-21 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-21 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-21 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-21 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-21 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-22 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-22 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-22 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-22 | GW | PCBs | All PCBs | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-22 | GW | Pests | All Pesticides | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-22 | GW | Pests | gamma-Chlordane | 0.05 | - | U | PD | %D between columns > 50% and sample results < CRQL. |
| 1004032 | M-22 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-23 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-23 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-23 | GW | Metals | Thallium | 25 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-23 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-23 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-23 | GW | VOCs | Acetone | 10 | - | U | TB | Trip blank contamination. |
| 1004032 | M-23 | GW | VOCs | Bromomethane | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004032 | M-24 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-24 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-24 | GW | Metals | Cadmium | 5 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-24 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-24 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-24 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-24 | GW | VOCs | Bromomethane | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004032 | M-25 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |

TABLE A-2
SUMMARY OF DATA QUALIFICATIONS
YEAR SEVEN OF THE LONG-TERM PHASE - SMALL FILLS
SHARKEY LANDFILL

| SDG | Field ID | Matrix | Analysis | Analyte | New Result | New RL | QUAL | Golder Qual Code | Comments |
|---------|----------|--------|----------|----------------------------|------------|--------|------|------------------|---|
| 1004032 | M-25 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-25 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-25 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-25 | GW | PCBs | All PCBs | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-25 | GW | Pests | All Pesticides | - | - | UJ | DMCL | DMC recoveries below QC Limits. |
| 1004032 | M-25 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004032 | M-25 | GW | VOCs | Acetone | 10 | - | U | TB | Trip blank contamination. |
| 1004032 | M-25 | GW | VOCs | Bromomethane | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004032 | M-26 | GW | Metals | Aluminum | 200 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-26 | GW | Metals | Beryllium | 5 | - | U | PB | Preparation blank contamination. |
| 1004032 | M-26 | GW | Metals | Cadmium | 5 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-26 | GW | Metals | Nickel | 40 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-26 | GW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004032 | M-26 | GW | Metals | Vanadium | 50 | - | U | CBC | Continuing calibration blank contamination. |
| 1004032 | M-26 | GW | SVOCs | anthracene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-26 | GW | SVOCs | atrazine | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-26 | GW | SVOCs | hexachlorobenzene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-26 | GW | SVOCs | phenanthrene | - | - | UJ | DMCL | DMC recovery below QC Limits. |
| 1004032 | M-26 | GW | VOCs | 1,4-dioxane | - | - | R | IRF | Initial calibration RRF < 0.010. |
| 1004058 | W1 U | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W1 U | SW | Metals | Beryllium | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W1 U | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W1 U | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W1 U | SW | SVOCs | 4-methylphenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W1 U | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |
| 1004058 | W2 U | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W2 U | SW | Metals | Barium | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W2 U | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W2 U | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W2 U | SW | SVOCs | Bis(2-chloroethyl)ether | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W2 U | SW | SVOCs | N-Nitroso-di-n-propylamine | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W2 U | SW | SVOCs | Phenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W2 U | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |
| 1004058 | W3 D | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W3 D | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W3 D | SW | SVOCs | 4-methylphenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W3 D | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |

TABLE A-2
SUMMARY OF DATA QUALIFICATIONS
YEAR SEVEN OF THE LONG-TERM PHASE - SMALL FILLS
SHARKEY LANDFILL

| SDG | Field ID | Matrix | Analysis | Analyte | New Result | New RL | QUAL | Golder Qual Code | Comments |
|---------|----------|--------|----------|----------------------------|------------|--------|------|------------------|---|
| 1004058 | W3D | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W4 U | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W4 U | SW | Metals | Beryllium | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W4 U | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W4 U | SW | Metals | Vanadium | 50 | - | U | PB | Preparation blank contamination. |
| 1004058 | W4 U | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W4 U | SW | SVOCs | 4-methylphenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W4 U | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |
| 1004058 | W4 U FD | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W4 U FD | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W4 U FD | SW | Metals | Vanadium | 50 | - | U | PB | Preparation blank contamination. |
| 1004058 | W4 U FD | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W4 U FD | SW | SVOCs | 4-methylphenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W4 U FD | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |
| 1004058 | W5 UD | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W5 UD | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W5 UD | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W5 UD | SW | SVOCs | 1,2,4,5-Tetrachlorobenzene | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | 2,3,4,6-Tetrachlorophenol | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | 2,4,5-Trichlorophenol | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | 2,4,6-Trichlorophenol | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | 2,4-Dichlorophenol | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | 4-chloro-3-methylphenol | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | Benzaldehyde | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | Bis(2-chloroethyl)ether | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W5 UD | SW | SVOCs | Hexachlorobutadiene | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | N-Nitroso-di-n-propylamine | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W5 UD | SW | SVOCs | Pentachlorophenol | - | - | UJ | DMCL | DMC recovery below QC limits. |
| 1004058 | W5 UD | SW | SVOCs | Phenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W5 UD | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |
| 1004058 | W6 U | SW | Metals | Aluminum | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W6 U | SW | Metals | Beryllium | - | - | U | CBC | Continuing calibration blank contamination. |
| 1004058 | W6 U | SW | Metals | Potassium | - | - | J | SD | Serial dilution %D above QC limits (10%). |
| 1004058 | W6 U | SW | Metals | Vanadium | 50 | - | U | PB | Preparation blank contamination. |
| 1004058 | W6 U | SW | Metals | Zinc | 60 | - | U | PB | Preparation blank contamination. |
| 1004058 | W6 U | SW | SVOCs | Bis(2-chloroethyl)ether | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W6 U | SW | SVOCs | N-Nitroso-di-n-propylamine | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W6 U | SW | SVOCs | Phenol | - | - | UJ | CRD | Continuing calibration %D outside QC limits (>25%). |
| 1004058 | W6 U | SW | VOCs | Carbon Disulfide | 0.5 | - | U | TB | Trip blank contamination. |

**TABLE A-2
SUMMARY OF DATA QUALIFICATIONS
YEAR SEVEN OF THE LONG-TERM PHASE - SMALL FILLS
SHARKEY LANDFILL**

| SDG | Field ID | Matrix | Analysis | Analyte | New Result | New RL | QUAL | Golder Qual Code | Comments |
|---------|----------|--------|----------|---------------------------|------------|--------|------|------------------|---|
| 1004066 | W1 U | SW | VOCs | 2-chloroethyl vinyl ether | - | - | R | CRD | Continuing calibration %Drift greater than 90%. |
| 1004066 | W1 U | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W1 U | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W2 U | SW | VOCs | 2-chloroethyl vinyl ether | - | - | UJ | LCSH | LCS recoveries above QC limits. |
| 1004066 | W2 U | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W2 U | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W3 D | SW | VOCs | 2-chloroethyl vinyl ether | - | - | R | CRD | Continuing calibration %Drift greater than 90%. |
| 1004066 | W3 D | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W3 D | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W4 U | SW | VOCs | 2-chloroethyl vinyl ether | - | - | UJ | LCSH | LCS recoveries above QC limits. |
| 1004066 | W4 U | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W4 U | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W4 U FD | SW | VOCs | 2-chloroethyl vinyl ether | - | - | R | CRD | Continuing calibration %Drift greater than 90%. |
| 1004066 | W4 U FD | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W4 U FD | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W5 UD | SW | VOCs | 2-chloroethyl vinyl ether | - | - | UJ | LCSH | LCS recoveries above QC limits. |
| 1004066 | W5 UD | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W5 UD | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W6 D | SW | VOCs | 2-chloroethyl vinyl ether | - | - | UJ | LCSH | LCS recoveries above QC limits. |
| 1004066 | W6 D | SW | VOCs | Acrolein | - | - | UJ | IRF | Initial calibration RRF < 0.050. |
| 1004066 | W6 D | SW | VOCs | Acrylonitrile | - | - | UJ | IRF | Initial calibration RRF < 0.050. |

Notes:

%D = Percent Difference.
 CRQL = Contract Required Quantitation Limit.
 DMC = Deuterated Monitoring Compound
 GW= Groundwater
 MS/MSD = Matrix Spike and Matrix Spike Duplicate
 PCBs = Polychlorinated Biphenyls
 Pests = Pesticides
 QC = Quality Control.
 Qual = Qualifier
 RL = Reporting limit
 RRF = Relative response factor.
 SVOC = Semivolatile Organic Compound
 SW = Surface water
 VOC = Volatile Organic Compound

Golder Codes:

CBC Continuing calibration blank contamination.
CRD Calibration verification %D.
DMCL DMC recovery below quality control limits.
IRF Initial Calibration RRF < 0.050/0.010.
LCSH Laboratory control sample above QC limits.
MB Method blank contamination.
PB Preparation blank contamination.
PD Percent difference between columns > 25%
SD Serial dilution %D.
TB Trip Blank contamination.

Qualifiers:

J = Result is estimated.
 UJ = Non-detected result is estimated.
 R = Sample result is rejected.
 JN = Tentatively identified, approximate concentration.
 U = The analyte was analyzed for, but was not detected above the method detection limit.

APPENDIX B
SUMMARY OF VALIDATED DATA
DETECTED ANALYTICAL TEST RESULTS, ANNUAL MONITORING EVENT
YEAR SEVEN OF THE LONG-TERM PHASE – SMALL FILLS

GROUNDWATER DATA

VOCs
Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

Site Area: NWN Fill

| Sample Name: | | | M-17 | | M-18 | | M-26 | |
|---------------|------|--------------|----------|------|----------|------|----------|------|
| Sample Date: | | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| Acetone | ug/l | | 9.3 | J | | | | |
| Chlorobenzene | ug/l | | 2.2 | J | 12 | | | |
| Total VOCs | ug/l | 1,000 | 11.5 | | 12 | | | |

Site Area: NWS Fill

| Sample Name: | | | M-19A | | M-19A FD | | M-20 | | M-21 | | M-22 | |
|---------------|------|--------------|----------|------|----------|------|----------|------|----------|------|----------|------|
| Sample Date: | | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| Acetone | ug/l | | | | 4.7 | J | 10 | | 11 | | 12 | |
| Chlorobenzene | ug/l | | | | | | | | | | | |
| Total VOCs | ug/l | 1,000 | | | 4.7 | | 10 | | 11 | | 12 | |

Site Area: SW Fill

| Sample Name: | | | M-23 | | M-24 | | M-25 | |
|---------------|------|--------------|----------|------|----------|------|----------|------|
| Sample Date: | | | 4/6/2010 | | 4/6/2010 | | 4/6/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| Acetone | ug/l | | | | | | | |
| Chlorobenzene | ug/l | | | | | | | |
| Total VOCs | ug/l | 1,000 | | | | | | |

Checked by: PLL 6/11/2010



July 2010

Summary of Validated Data
Detected Analytical Test Results
SVOCs

943-6198

Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

Site Area: NWN Fill

| | | | | | | | | |
|-----------------------------|------|--------------|----------|------|----------|------|----------|------|
| Sample Name: | | | M-17 | | M-18 | | M-26 | |
| Sample Date: | | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| Bis(2-ethylhexyl) Phthalate | ug/l | 100 | | | | | | |

Site Area: NWS Fill

| | | | | | | | | | | | | |
|-----------------------------|------|--------------|----------|------|----------|------|----------|------|----------|------|----------|------|
| Sample Name: | | | M-19A | | M-19A FD | | M-20 | | M-21 | | M-22 | |
| Sample Date: | | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| Bis(2-ethylhexyl) Phthalate | ug/l | 100 | | | | | | | | | | |

Site Area: SW Fill

| | | | | | | | | |
|-----------------------------|------|--------------|----------|------|----------|------|----------|------|
| Sample Name: | | | M-23 | | M-24 | | M-25 | |
| Sample Date: | | | 4/6/2010 | | 4/6/2010 | | 4/6/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| Bis(2-ethylhexyl) Phthalate | ug/l | 100 | | | | | 3.1 | J |

Checked by: PLL 6/11/2010



July 2010

Summary of Validated Data
 Detected Analytical Test Results
 Pesticide/PCBs
 Year Seven of the Long-Term Phase - Small Fills Monitoring Event
 Sharkey Landfill
 Morris County, New Jersey

943-6198

Site Area: NWN Fill

| Sample Name: | | | M-17 | | M-18 | | M-26 | |
|--------------|------|--------------|----------|------|----------|------|----------|------|
| Sample Date: | | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| beta-BHC | ug/l | | | | | | | |

Site Area: NWS Fill

| Sample Name: | | | M-19A | | M-19A FD | | M-20 | | M-21 | | M-22 | | M-23 | |
|--------------|------|--------------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|
| Sample Date: | | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/6/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| beta-BHC | ug/l | | 0.053 | JN | | | 0.056 | JN | | | | | | |

Site Area: SW Fill

| Sample Name: | | | M-24 | | M-25 | |
|--------------|------|--------------|----------|------|----------|------|
| Sample Date: | | | 4/6/2010 | | 4/6/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual |
| beta-BHC | ug/l | | | | | |

Checked by: PLL 6/11/2010

Inorganics
Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

Site Area: NWN Fill

| | | Sample Name: | M-17 | | M-18 | | M-26 | |
|-----------|------|--------------|----------|------|----------|------|----------|------|
| | | Sample Date: | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| Aluminum | ug/l | | | | 864 | | | |
| Arsenic | ug/l | 50 | | | | | | |
| Barium | ug/l | 1000 | 677 | | 127 | J | 83.5 | J |
| Calcium | ug/l | | 83800 | | 94400 | | 37900 | |
| Chromium | ug/l | 50 | | | 1.3 | J | | |
| Copper | ug/l | | | | | | 45.2 | |
| Iron | ug/l | | 48800 | | 10500 | | 550 | |
| Lead | ug/l | 50 | 14.9 | | 6.3 | J | 15.6 | |
| Magnesium | ug/l | | 12400 | | 36800 | | 5270 | |
| Manganese | ug/l | | 169 | | 1810 | | 181 | |
| Nickel | ug/l | | | | | | | |
| Potassium | ug/l | | 7620 | J | 7470 | J | 3750 | J |
| Selenium | ug/l | 10 | | | | | | |
| Sodium | ug/l | | 31600 | | 31800 | | 42900 | |
| Zinc | ug/l | | 8.2 | J | 12.2 | J | 41.9 | J |
| Cyanide | ug/l | | 5.1 | J | 3.5 | J | 2.9 | J |

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Inorganics
Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

Site Area: NWS Fill

| | | Sample Name: | M-19A | | M-19A FD | | M-20 | | M-21 | | M-22 | |
|-----------|------|--------------|----------|------|----------|------|----------|------|----------|------|----------|------|
| | | Sample Date: | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | | 4/5/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| Aluminum | ug/l | | | | | | | | | | | |
| Arsenic | ug/l | 50 | 4.2 | J | 2.6 | J | | | 9.9 | J | 6.6 | J |
| Barium | ug/l | 1000 | 360 | | 349 | | 926 | | 300 | | 411 | |
| Calcium | ug/l | | 88600 | | 86400 | | 110000 | | 54100 | | 109000 | |
| Chromium | ug/l | 50 | 0.81 | J | | | 4.2 | J | | | | |
| Copper | ug/l | | | | | | | | | | | |
| Iron | ug/l | | 13800 | | 13200 | | 29800 | | 17500 | | 24200 | |
| Lead | ug/l | 50 | | | 2.1 | J | 3.6 | J | 6.2 | J | 4.9 | J |
| Magnesium | ug/l | | 28000 | | 27600 | | 40100 | | 15300 | | 31700 | |
| Manganese | ug/l | | 667 | | 677 | | 1450 | | 294 | | 833 | |
| Nickel | ug/l | | | | | | | | 6.9 | J | 10.9 | J |
| Potassium | ug/l | | 4580 | J | 4590 | J | 22300 | J | 19900 | J | 35200 | J |
| Selenium | ug/l | 10 | | | | | 2.9 | J | | | | |
| Sodium | ug/l | | 113000 | | 113000 | | 131000 | | 29800 | | 71400 | |
| Zinc | ug/l | | 2.4 | J | | | 5.8 | J | 5.8 | J | 6.4 | J |
| Cyanide | ug/l | | 2 | J | 2.7 | J | 5.7 | J | 10.1 | | 6.4 | J |

Checked by: PLL 6/11/2010

Summary of Validated Data
Detected Analytical Test Results
Inorganics

Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

Site Area: SW Fill

| | | Sample Name: | M-23 | | M-24 | | M-25 | |
|-----------|------|--------------|----------|------|----------|------|----------|------|
| | | Sample Date: | 4/6/2010 | | 4/6/2010 | | 4/6/2010 | |
| Parameter | Unit | Well Trigger | Result | Qual | Result | Qual | Result | Qual |
| Aluminum | ug/l | | | | | | | |
| Arsenic | ug/l | 50 | | | | | 2.6 | J |
| Barium | ug/l | 1000 | 403 | | 109 | J | 151 | J |
| Calcium | ug/l | | 83500 | | 105000 | | 79000 | |
| Chromium | ug/l | 50 | 1.2 | J | | | | |
| Copper | ug/l | | | | | | | |
| Iron | ug/l | | 53200 | | 1790 | | 59400 | |
| Lead | ug/l | 50 | 4 | J | | | 3.4 | J |
| Magnesium | ug/l | | 28100 | | 8120 | | 22400 | |
| Manganese | ug/l | | 4830 | | 463 | | 2770 | |
| Nickel | ug/l | | | | 19 | J | | |
| Potassium | ug/l | | 9220 | J | 3940 | J | 743 | J |
| Selenium | ug/l | 10 | 2.6 | J | | | | |
| Sodium | ug/l | | 65100 | | 7120 | | 39800 | |
| Zinc | ug/l | | 16.6 | J | 743 | | 2.6 | J |
| Cyanide | ug/l | | 4.5 | J | 3.5 | J | 2.9 | J |

Checked by: PLL 6/11/2010

SURFACE WATER DATA

July 2010

Summary of Validated Data
Detected Analytical Test Results

943-6198

VOCs
Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

| Sample Name: Sample Date: | | | W1 U 4/7/2010 | | W2 U 4/7/2010 | | W3 D 4/7/2010 | | W4 U 4/7/2010 | | W4 U FD 4/7/2010 | | W5 UD 4/7/2010 | | W6 D 4/7/2010 | |
|------------------------------|------|---------------|------------------|------|------------------|------|------------------|------|------------------|------|---------------------|------|-------------------|------|------------------|------|
| Parameter | Unit | River Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| Acetone | ug/l | | | | | | | | | | | | | | 3.6 | J |
| Toluene | ug/l | 6800 | 0.041 | J | 0.055 | J | 0.067 | J | 0.072 | J | 0.076 | J | 0.099 | J | 0.065 | J |

Checked by: PLL 6/11/2010

July 2010

Summary of Validated Data
Detected Analytical Results
SVOCs

943-6198

Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

| Sample Name: | | W1 U | | W2 U | | W3 D | | W4 U | | W4 U FD | | W5 UD | | W6 D | | |
|----------------------|------|---------------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|------|
| Sample Date: | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | |
| Parameter | Unit | River Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| No Analytes Detected | ug/l | | | | | | | | | | | | | | | |

Checked by: PLL 6/11/2010

July 2010

Summary of Validated Data
Detected Analytical Test Results

943-6198

Pesticides/PCBs
Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

| Sample Name: | | | W1 U | | W2 U | | W3 D | | W4 U | | W4 U FD | | W5 UD | | W6 D | |
|----------------------|------|---------------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|
| Sample Date: | | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | |
| Parameter | Unit | River Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| No Analytes Detected | ug/l | | | | | | | | | | | | | | | |

Checked by: PLL 6/11/2010

July 2010

Summary of Validated Data
Detected Analytical Test Results
Metals

943-6198

Year Seven of the Long-Term Phase - Small Fills Monitoring Event
Sharkey Landfill
Morris County, New Jersey

| | | Sample Name: | W1 U | | W2 U | | W3 D | | W4 U | | W4 U FD | | W5 UD | | W6 D | |
|-----------|------|---------------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|
| | | Sample Date: | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | | 4/7/2010 | |
| Parameter | Unit | River Trigger | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| Barium | ug/l | | 22.7 | J | | | 39.9 | J | 36.2 | J | 35.4 | J | 35.5 | J | 38.3 | J |
| Calcium | ug/l | | 19900 | | 28300 | | 29100 | | 27600 | | 27600 | | 28500 | | 28900 | |
| Chromium | ug/l | | | | | | | | 2.8 | J | | | | | | |
| Iron | ug/l | | 764 | | 412 | | 477 | | 570 | | 538 | | 727 | | 523 | |
| Lead | ug/l | | 1.6 | J | 1.9 | J | 2.1 | J | | | | | 1.8 | J | | |
| Magnesium | ug/l | | 6310 | | 9230 | | 9400 | | 9040 | | 8940 | | 9040 | | 9310 | |
| Manganese | ug/l | | 214 | | 79.9 | | 97.8 | | 143 | | 139 | | 161 | | 104 | |
| Potassium | ug/l | | 1970 | J | 2160 | J | 2160 | J | 2180 | J | 2100 | J | 2160 | J | 2260 | J |
| Selenium | ug/l | | | | | | | | 2.3 | J | | | | | | |
| Sodium | ug/l | | 45800 | | 49100 | | 49900 | | 50600 | | 49700 | | 50600 | | 50900 | |
| Vanadium | ug/l | | | | 0.59 | J | | | | | | | | | | |
| Cyanide | ug/l | | | | 1.9 | J | 1.6 | J | 1.7 | J | | | | | | |

Checked by: PLL 6/14/2010

APPENDIX C

**NJDEP HZSITE ELECTRONIC DATA DELIVERABLE, ANNUAL MONITORING EVENT
YEAR SEVEN OF THE LONG-TERM PHASE – SMALL FILLS**